ANEURYSMORRHAPHY.

PERSONAL EXPERIENCE WITH THE MODERN METHOD OF TREATING ANEURYSM.*

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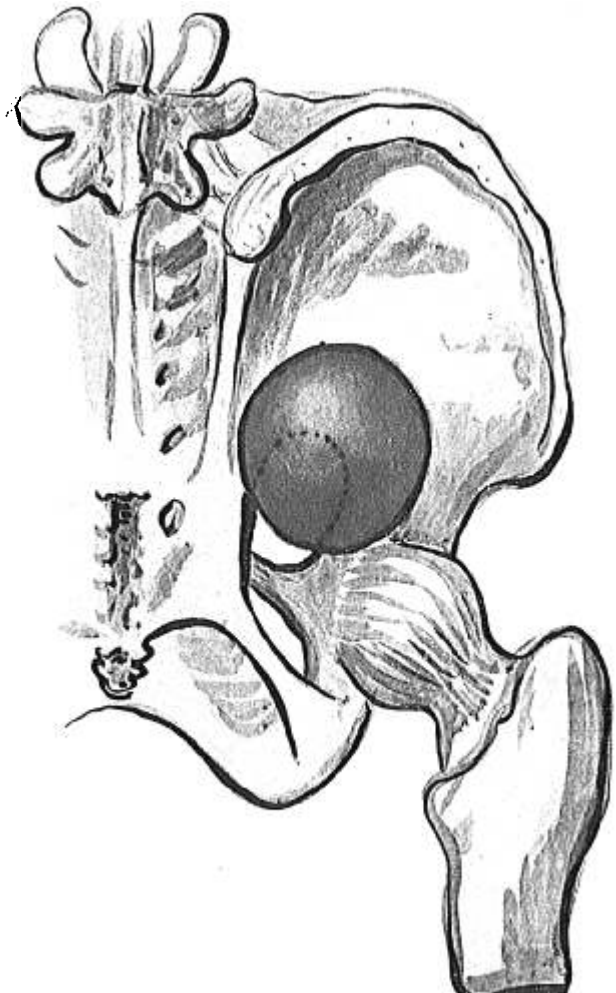
THIRTY years ago, it was considered safest to cure an aneurysm by arresting its blood current by digital compression, for a sufficient time to fill it with solid clot. It was common practice for the college professor to call for relays of volunteer medical students, to compress a femoral artery under thumb or finger pressure, for two days or more, until the aneurysm was solidly clotted. My personal experience as a student on two such occasions, gives me a lively remembrance of the tediousness of the method. Ligation by silk in those pre-Listerian days, resulted too often in fatal hemorrhage by ulceration of the vessel. Subsequently, antiseptic ligation held the field almost exclusively. One idea dominated the whole teaching of treatment, namely, the successful filling of the sac by clot, which subsequently "organized" and shrank. By organization was meant fibroid change with slow vascularization extending into the clot.

Ten years later, the theory of thickening and stiffening the resisting wall of the sac, by induced inflammation and cell proliferation was advocated, and its use put to the test in aortic, innominate and other inoperable types of aneurysm. The theory of building up and fortifying the wall from within, soon became accepted as an available method and new hope was excited. In 1886 and '87 the introduction into the sacs, of silver and steel wire, or of silk thread, was advocated, with the double purpose to induce clotting and irritate the sac lining. About the same date, puncture of the wall, by electrolytic needles, using a sharp current to excite inflammation had many

* Read before the Section on Surgery of the New York Academy of Medicine, March 6, 1908.

Fig. 1.



Aneurysm of the gluteal artery, filling the sciatic notch, grave neuralgia from sciatic pressure. Cured by matas operation.

advocates, and considerable success. Even Macewen's later method of scratching the lining with long hatpins, transfixing the sac, was based on the same theory.

Proliferation of the endarterial coats, was the keynote of the success of these methods. I myself had at this time two extremely interesting aneurysms of the aortic arch, into whose sacs I introduced, through a hollow needle, once, a hundred feet of sterile catgut, and again one hundred and fifty feet of fine steel piano wire, exciting its cells by electric contact for an hour (the opposite pole being at the back). Much was gained, as had been in the hands of others, the reports of which I incorporated in a paper (Med. News., Apl. 9, 1887). Some patients so treated survived several months. Autopsy occasionally showed the wire buried in the densely over-grown aneurysmal wall. In Loreta's case, in the abdominal aorta, the sac closed tightly round six feet of silver wire, and in healing, compressed it into a small mass.

Two facts were demonstrated by these valuable contributions to our surgical knowledge of aneurysm: First, that the sac wall, if irritated, can be made the important factor in curing aneurysm; second, that where the tumor is large, the endarterial lining is considerably replaced by cellular tissue and the thinned out lining is too far gone to be available, —failure by such method is sure. In the case of Loreta's aneurysm of the abdominal aorta, there was no dissecting into outside tissues, but it had a complete endarterial lining,—hence fine plastic repair under wire excitation.

This demonstration of the value of the reparative building up of the aneurysm wall, rather than relying on clot filling alone to cure an aneurysm, prepared the surgical world to receive the new method of Dr. Matas.

I was able to employ it first in May, 1905, in a popliteal aneurysm of considerable size, which had been giving much pain from nerve pressure.

It was a simple matter to have the femoral artery compressed during the operation, and then on splitting open the sac, through a vertical skin incision, I found its walls were

eccentric to the artery, strong and continuous on the side toward the joint, but thinned out posteriorly. It was not difficult to place a fine chromicized catgut suture at the open mouth of the artery, and suture the walls together by continuous stitch from above downward, till the sac was entirely closed. One branching vessel opened into its lower half and was included in the suture. The same thread was continued into the overlying fascia and subcutaneous areola layer. A compress dressing without much pressure, gave primary union, and the case was perfectly cured without the slightest peril to the circulation of the foot. Prompt relief of pain followed.

Two things impressed me as especially gratifying: I left the work with no anxiety that I might have cut off a single superfluous drop of blood from the foot, as I might have done had I tied the femoral; and I felt that no recurrent anastomosis by the lower open mouth vessel which I sutured, could continue the dissecting action of the aneurysm. This I had once seen in a similar case after ligation.

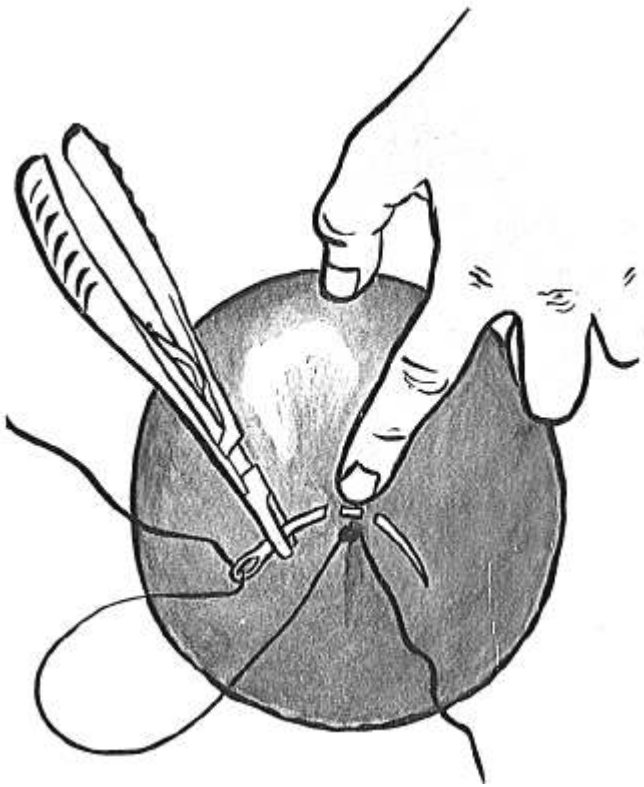
With this experiment I was prepared to apply the method to my second case, where it was peculiarly available.

A young Russian of 24 years had been developing for three months, right sciatic neuralgia with disability in walking, and some swelling of his foot. A pulsating tumor of the right gluteal region prevented his lying on that side also. The man had never had syphilis, but acknowledged gonorrhœa. His heart showed a blowing aortic murmur. Examination showed a spherical, pulsating tumor, three inches in diameter, beneath the gluteus muscle at the sciatic notch, where its pressure had caught the sciatic nerve, and held it tightly against the bone,—hence the neuralgia.

It was a particularly good case for operation by the plastic method, because ligation of the external iliac, while it would temporarily arrest the current, would allow free anastomosis and possible return; meanwhile leaving the distended sac to continue sciatic pressure.

On May 21, 1906, I opened the iliac fossa and threw a temporary silk ligature about the external iliac artery, which was held

FIG. 2.



Internal aspect of aneurysm, finger tip covering gluteal artery opening. Commencement of internal occlusive suture.

as a loop by my assistant, Dr. W. S. Schley, who drew it up against his index finger-tip, so as to avoid crushing it by tight ligation. This compression at once stopped pulsation in the tumor. I then incised over the tumor, and separated the gluteus. The sac was well distended and easily isolated. Its neck filled the uppermost corner of the sciatic notch (Fig. 1). On compression, after the pulsation had been stopped from above, it emptied, and quickly filled again. By inference, this must have been by anastomosis, as this iliac artery was quite occluded by the silk loop.

Seeing no way to keep it entirely empty; I ventured to cut it freely open, and relied on instant internal pressure to stop loss of blood. I first plugged the opening of the gluteal artery with my index finger-tip, and found no other bleeding occurred. I was then able to dry its walls and see that they were firm, with good serous lining. On releasing my finger pressure ever so little, a sharp flow of blood followed, but not in pulsating current. I now began a continuous suture of the internal wall, with fine chromicized catgut, first fixing it by a knot just above my finger-tip (Fig. 2). The next stitches were placed so as to catch in the sac wall, on both sides of my finger-tip, which I drew back as I quickly tightened them, thus sealing up the deepest part of the funnel-shaped cavity. After placing the first four deep stitches there was no bleeding, and I leisurely secured one wall against the other by continuous back and forth suturing, with the same thread. I even continued this until I had obliterated the entire sac, and closed the super structures, with no additional knot. The silk thread was removed from the iliac. The wound was bloodless. The patient made an immediate recovery.

Here we have a brilliant illustration of the reliance to be placed on the plastic union of opposing walls of an artery, held in contact, and irritated by the needle puncture and thread. This patient had no recurrence of tumor or sciatic pain up to three months after operation.

The question arises, as to how large an aneurysm we may venture to treat by this method (and how near the aorta). My own conviction is that it may be applied to any artery up to the innominate. If a firm clamp compresses the artery, we will say the subclavian, proximal to the aneurysm, the operator

can leisurely and surely occlude the sac. I can see little difference in the detail from that just narrated, and no reason for failure. I am prepared to go further and say, that if a suitable case of aortic aneurysm in the abdomen presented itself, it would be justified to combine this valuable method with one illustrated by me in 1894 (New York Medical Journal). We then showed the effect of introducing sterile glass tubes, of sizes suitable to the artery, into the lumen of divided vessels, and tying the arterial wall over each end of the tube, the latter being filled with salt solution, just before letting the current resume its course through it. I did this in a cat after cutting the abdominal aorta across, and four months afterward showed a fine healthy, and happy cat on this very platform, with the glass tube healed solidly into her aorta, the plastic exudate buried the tube, and the blood flowed for days through it, until at last the tube excited endarteritis, and occlusion resulted. Meanwhile, collateral circulation had ample time to be established. There seems to be no reason why an aortic aneurysm, below the superior mesenteric, might not be so treated. The current being arrested by strong pressure against the vertebra, the sac might be split, a tube inserted and tied in at either end; and a suture of the aneurysmal wall made tightly about the tube. It is probable that solid closure of the whole track would take place in a week, and occlusion of the aorta above and below be effected, as in my cat, by endarteritis from the presence of the tube. Meanwhile, free anastomosis would surely be established to the lower limbs. That situation is rare for aneurysm, but many cases are recorded, and the aorta has been actually ligated a number of times, in despairing hope of anastomosis, as published by Dr. Keen. The new plastic method may yet triumph.

Surgeons owe Dr. Matas high tribute for perfecting and advocating the technic of his method. The saddest side of this subject is, that, just as we have so promising and scientific a demonstration offered to the world, aneurysms seem to be going out of fashion.